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ing or decaying would produce this position. We know first of all that the pull is exerted by the muscles and tendons, and the reason why opisthotonos is the more commonly seen is that the muscles of the neck are strongest. In this spastic condition all the muscles of the body are intensely contracted and the more powerful muscles overcome the resistance of the weaker ones. It is interesting to observe in this connection that in the arm muscles of the male frog the pull of the strong flexors, used in the mating season for retaining the female, overcome the extensors and flex the arms into the attitude of embracing, while in the female frog the extensors overcome the flexors and the arms stick out straight, while in a spastic condition. Occasionally, however, as in pleurothotonos, the lateral muscles overcome the dorsal ones. Secondly the ligaments of the vertebral column are but slightly elastic, and I am sure it would puzzle Dr. Dean to furnish examples of opisthotonos caused by the action of the ligaments. If the ligaments did cause this phenomenon then the head should be pulled the other way, for the ventral ligaments drying first would overpower the dorsal ones. Sheep, cattle and horses are commonly seen dead in this position on the western plains, but no one can prove that the drying or rotting of the ligaments caused the attitude, while it is easily and daily proven that they died in a spastic condition, in opisthotonos.

Opisthotonos and its related phenomena can not be rightly regarded as a special form of disease, but rather as a result accompanying many forms of disease and poisoning. The Century Dictionary regards opisthotonos as a malady, but the word malady in medicine is almost meaningless.

Another important phase of the matter and a more difficult one to solve was suggested by Dr. Matthew. Vertebrate fossils are not always figured and studied in the positions in which they died. They are subject to so many disturbing agencies, wind, water and predatory animals, that we can not be sure that the position is really the one in which they died. Often the limbs and parts of the

body are shifted in preparing for museum exhibition. On this point, of course, no one can speak with more authority than can Dr. Matthew, but it occurs to me that a sufficient number of animals have been discovered in an undisturbed position to warrant the conclusion that *some* of the vertebrates preserved in the opisthotonos were the victims of disease. The beautiful skeleton of *Steneosaurus bollenis* in the U. S. National Museum, exhibits one of the most interesting examples of this known to the writer.

The point is still open to discussion. We need more evidence from the medical side as to the exact nature of opisthotonos, and from the paleontological side more exact observations by paleontologists of the positions in which the animals are preserved in the rocks. It will be with extreme interest that further discussion on this interesting topic, the antiquity of disease in all its phases, will be read.

ROY L. MOODIE

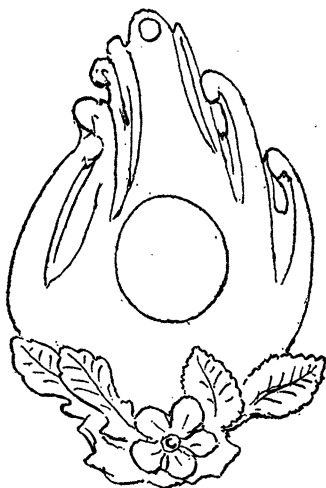
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A CHINESE LAMP IN A YUCATAN MOUND

A RECENT publication of the United States Bureau of Ethnology is a report of Thomas W. F. Gann on the "Maya Indians of Southern Yucatan and Northern British Honduras." Herein is given an interesting account of the people and a description of a series of mounds presenting very curious examples of the ancient Maya pottery and odd-shaped objects of obsidian. In one mound there was found near its surface a soapstone lamp which Mr. Gann recognizes as markedly unlike other objects of Maya fabrication. He says:

So widely does it differ from Maya standards that there can be but little doubt that it was introduced in post-Columbian days, probably very soon after the conquest. Another explanation which suggests itself is that the lamp was buried in the mound at a much later date (possibly during the troublous times of the Indian rebellions, between 1840 and 1850) by someone who wished to hide it temporarily, and that it had no connection with the original purpose of the mounds.

This latter conjecture is the correct one so far as its age is concerned. It is a modern Chinese lamp made in the vicinity of Canton. I give a rough sketch of one given to me in



1854 when I was a boy, for my cabinet of curiosities. It had been brought from Canton and was probably made by the same artisan who carved the lamp figured by Mr. Gann. In the Peabody Museum at Salem are two lamps of identical character and design. As there were probably no Chinese coolies in Yucatan fifty years ago is it not possible that some one buried the object within recent years to support the contention by some that the culture of Middle America was introduced from China!

EDWARD S. MORSE

SALEM, MASS.,

August 27, 1919.

QUOTATIONS

INDUSTRIAL FATIGUE AND SCIENTIFIC MANAGEMENT

THE Industrial Fatigue Research Board was appointed at the end of 1917 by the Department of Scientific and Industrial Research to investigate the relations of the hours of labor and other conditions of employment to the production of fatigue having regard both to industrial efficiency and to the preservation of the health of workers. This board has recently issued two reports. One of these,

Ethel E. Osborne, M.Sc., on the output of women workers in relation to hours of work in shell-making, arrives at results for which previous investigations have prepared us. The investigations were concerned with the first operation to which the rough forging is subjected; it consists in cutting off the end portion of the forging to reduce it to the required length. It is considered the hardest work in shell-making, must be done rapidly, and entails constant changing of shells. For eighteen months the women doing this in the National Ordnance Factory worked on shifts of twelve hours' duration, with night and day work in alternate weeks. It then became evident that the hours were affecting the women adversely, and the shifts were shortened. Some time previously the machines had been changed to a type which considerably reduced the demands for violent physical exertion. The method in which the investigation was conducted is described at length, but we can only notice the chief general results. Under the earlier scheme the average number of hours worked was 55.85 a week, under the shortened scheme 35.65 a week. On the long hours system the average number of shells each operator turned out in an hour was 8.17; on the shortened shift it was 8.70. Study of the actual fraction of the total working time occupied in the automatic cutting of shells and in their handling respectively—the latter being a period in which speeding up was possible—showed that the work accomplished in 100 minutes of the long hour system was carried out in 80.5 minutes of the short system—a decrease of 19.5 per cent. in time. Taking the average hourly output of shells per hour of actual work as 100, the average hourly output of shells per hour in the factory under the long hour scheme was 85.43, and under the short hour scheme 92.41. The second part of the report is based on a study of actual hourly output; it shows a uniformly low efficiency in the last hour of the long shifts, whereas no such uniformity was to be observed in the case of the short shifts. In some instances there was no falling off at all. A comparison of the records of the same